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## Fat Embolism

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### Overview

An embolus is something that travels through the bloodstream and lodges in a place where it would not ordinarily be. A fat embolism has nothing to do with being overweight. It occurs when a fat particle or droplet travels through the circulation and eventually blocks a blood vessel. Fat emboli tend to be small and multiple, causing numerous signs and symptoms.

### Causes

The majority of cases are associated with trauma and fracture of, or surgery on a large bone. As a result of the broken bone, the bone marrow fat escapes into the bloodstream. A fat embolism can also occur as a result of liposuction. Sometimes a fat embolism arises due to diseases that alter lipid metabolism in the body such as pancreatitis or diabetes. Fat embolism can also arise from parenteral lipid infusion, this is a form of nutritional supplementation given to patients who cannot eat at all, for example, a coma patient. Other causative factors, although rare, are burns and childbirth.



### Symptoms

Signs of a fat embolism become evident in most cases in the first twenty four to seventy two hours after the causative factor has occurred. Symptoms are varied as they can include a range of body systems depending on where the embolism is wedged.

Symptoms can include:

- ❖ an altered mental state with symptoms including irritability, agitation, headache, confusion, seizures or coma;
- ❖ lung problems including rapid breathing, shortness of breath, difficulty breathing and a low oxygen level, also known as hypoxia;
- ❖ a rash on the skin caused by blockages in small blood vessels leading to small pin point haemorrhages, usually in the upper torso. These haemorrhages also occur in the eye; and
- ❖ high body temperature in excess of thirty eight degrees Celsius.



*This picture shows a rash caused by a fat embolism*

### Diagnosis

Diagnosis is made based on a patient's presenting condition and symptoms, as well as a process of exclusion of other possible causes. It is likely most patients will have chest x-rays, blood tests and computer tomography (CT) scans, as well as cardiac investigations such as echocardiography to exclude a cardiac cause of the symptoms.

## Treatment

There is no specific treatment for fat embolism, prevention and early detection are key factors. Once it has occurred therapy is aimed at relieving symptoms and providing supportive care. Supportive care includes maintaining levels of adequate oxygenation and ventilation, stabilising haemodynamics, hydration, prevention of deep venous thrombosis, and nutrition. The goals of pharmacotherapy are to reduce morbidity and prevent complications. Supportive care is the mainstay of therapy for clinically apparent fat embolism syndrome.

Prompt stabilisation of fractures can reduce the likelihood of a fat embolism occurring.

High dose corticosteroids have been effective in preventing development of a fat embolism in several trials, however, use and effectiveness is still controversial.



## Prognosis

- The mortality rate from fat embolism syndrome is five to fifteen percent. Even severe respiratory failure associated with fat embolism rarely leads to death.
- Neurological deficit and comas may last for days or weeks. Other side effects may include personality changes, memory loss and cognitive dysfunction.

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